UNITED STATES DEPARTMENT OF COMMERCE
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
08/870,836	06/06/97	HAMPAPUR	A VIRAGE.007A

LM02/0428

KNOBBE MARTENS OLSON & BEAR
620 NEWPORT CENTER DRIVE
SIXTEENTH FLOOR
NEWPORT BEACH CA 92660-8016

EXAMINER
RAO, A

ART UNIT	PAPER NUMBER
2713	

DATE MAILED: 04/28/99

Please find below and/or attached an office **communication concerning this application or proceeding.**

Commissioner of Patents and Trademarks

DETAILED ACTION

Drawings

1.   This application has been filed with informal drawings which are acceptable for

examination purposes only. Formal drawings will be required when the application is allowed.

Specification

2.   The specification has not been checked to the extent necessary to determine the presence

of all possible minor errors. Applicant's cooperation is requested in correcting any errors of

which applicant may become aware in the specification.

Claim Rejections - 35 USC § 102

3.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the

basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless --
>
> (e) the invention was described in a patent granted on an application for patent by another filed in the United
> States before the invention thereof by the applicant for patent, or on an international application by another who
> has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention
> thereof by the applicant for patent.

4.   Claims 1-22 are rejected under 35 U.S.C. 102(e) as being anticipated by Zhang et al.,

(hereinafter referred to as "Zhang").

        Zhang discloses a computerized method (Zhang: column 4, lines 45-55) of extracting a

key frame (Zhang: column 3, lines 1-7) from a video comprising the steps of: providing a

reference frame (Zhang: column 5, lines 18-20); providing a current frame different from the reference frame (Zhang: column 5, lines 21-23); determining a chromatic difference measure between the reference and current frame (Zhang: column 4, lines 1-20; column 3, lines 20-25: pair wise pixel comparison as represented by the pixel color component histograms); determining a structural difference measure between the reference and current frame (Zhang: column 7, lines 30-40 and 42-51: determining "temporal variation of video content" in terms of image features); and identifying a current frame as a key if the chromatic difference measure exceeds a first threshold and the structural difference measure exceeds a second threshold (Zhang: column 6, lines 20-65: as implemented in a 'multi-pass' analysis), as in claim 1.

        Zhang discloses a computerized method (Zhang: column 4, lines 45-55) of extracting a key frame (Zhang: column 3, lines 1-7) from a video comprising the steps of: providing a reference frame (Zhang: column 5, lines 18-20); providing a current frame different from the reference frame (Zhang: column 5, lines 21-23); determining a first difference measure between the reference and current frame (Zhang: column 4, lines 1-20; column 3, lines 20-25: pair wise pixel comparison as represented by the pixel color component histograms); determining a second difference measure between the reference and current frame (Zhang: column 7, lines 30-40 and 42-51: determining "temporal variation of video content" in terms of image features); and identifying a current frame as a key if the first difference measure exceeds a first threshold and the second difference measure exceeds a second threshold (Zhang: column 6, lines 20-65: as implemented in a 'multi-pass' analysis), as in claim 8.

Regarding claims 2 and 9, Zhang discloses setting the current frame as a reference frame if a key frame is identified (Zhang: column 7, lines 44-45) as in the claims.

Regarding claims 3 and 10, Zhang discloses repeating the steps for a new current frame until the end of the video is reached (Zhang: column 7, lines 48-50), as specified.

Regarding claims 4 and 11, Zhang discloses selecting the new current frame at a predetermined time interval after the current frame (Zhang: column 6, lines 5-10), as specified.

Regarding claims 5 and 12, Zhang discloses that the predetermined time interval is user selectable (Zhang: column 6, lines 36-45), as in the claims.

Regarding claims 6 and 13, Zhang discloses that both the first and second thresholds are user selectable (Zhang: column 7, lines 1-29), as in the claims.

Regarding claims 7 and 14, Zhang discloses that the second difference measure is only performed if the first difference measure exceeds the first threshold (Zhang: column 6, lines 30-40), as in the claims.

Regarding claims 15-16, Zhang discloses that the second difference measure is more computationally intensive and extracts more information that the first difference measure (Zhang: column 7, lines 1-60), as in the claims.

Regarding claim 17, Zhang discloses using a third difference measure (Zhang: column 3, lines 45-68), as in the claim.

Zhang discloses a computerized method (Zhang: column 4, lines 45-55) of extracting a key frame (Zhang: column 3, lines 1-7) from a video comprising the steps of: providing a

reference frame (Zhang: column 5, lines 18-20); providing a current frame different from the

reference frame (Zhang: column 5, lines 21-23); determining a structure difference measure

between the reference and current frame (Zhang: column 7, lines 30-40 and 42-51: determining

"temporal variation of video content" in terms of image features); and identifying a current frame

as a key if the chromatic difference measure exceeds a first threshold and the structural difference

measure exceeds a second threshold (Zhang: column 6, lines 20-65: as implemented in a 'multi-

pass' analysis), as in claim 18.

Regarding claim 1 9, Zhang discloses setting the current frame as a reference frame if a

key frame is identified (Zhang: column 7, lines 44-45) as in the claim.

Regarding claim 20, Zhang discloses repeating the steps for a new current frame until the

end of the video is reached (Zhang: column 7, lines 48-50), as specified.

Regarding claim 21, Zhang discloses selecting the new current frame at a predetermined

time interval after the current frame (Zhang: column 6, lines 5-10), as specified.

Regarding claim 22, Zhang discloses that both the threshold is user selectable (Zhang:

column 7, lines 1-29), as in the claim.

Conclusion

5.   The prior art made of record and not relied upon is considered pertinent to applicant's

disclosure. Maudlin discloses a system and method for skimming digital audio/video data. Jain

discloses a machine synthesis of a virtual video camera/image of a scene of multiple video

cameras/images of the scene. Zabih discloses an apparatus and process for detecting scene breaks

in a sequence of video frames. Youden discloses video on demand system with a multiple data

sources configured to provide VCR-like services.

6.   Any inquiry concerning this communication or earlier communications from the examiner

should be directed to Anand S. Rao whose telephone number is (703)-305-4813 .

ANAND S. RAO
PATENT EXAMINER

asr

April 22, 1999

	Application No.	Applicant(s)	
Office Action Summary	08/870,386	Hamapapur et al.	
	Examiner	Group Art Unit	
	Anand Rao	2713	

☐ Responsive to communication(s) filed on _____ .

☐ This action is **FINAL.**

☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire _____3_____ month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claims

☒ Claim(s) *1-22* is/are pending in the application.

    Of the above, claim(s) _____ is/are withdrawn from consideration.

☐ Claim(s) _____ is/are allowed.

☒ Claim(s) *1-22* is/are rejected.

☐ Claim(s) _____ is/are objected to.

☐ Claims _____ are subject to restriction or election requirement.

Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

    ☐ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been

       ☐ received.

       ☐ received in Application No. (Series Code/Serial Number) _____ .

       ☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

    *Certified copies not received: _____ .

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

☒ Notice of References Cited, PTO-892

☒ Information Disclosure Statement(s), PTO-1449, Paper No(s). ___4___

☐ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- *SEE OFFICE ACTION ON THE FOLLOWING PAGES* ---

DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE	ATTY. DOCKET NO. VIRAGE.007A	APPLICATION NO. 08/870,838
...ON DISCLOSURE STATEMENT BY APPLICANT	APPLICANT Hampapur, et al.	
(USE SEVERAL SHEETS IF NECESSARY)	FILING DATE June 6, 1997	GROUP ~~2315~~ 2713

U.S. PATENT DOCUMENTS

EXAMINER INITIAL		DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	FILING DATE (IF APPROPRIATE)
AR		5,488,482	01/30/96	Ueda et al.	358	339	
AR		5,485,611	01/16/96	Astle	395	600	
AR		5,471,239	11/28/95	Hill et al.	348	155	
AR		5,459,517	10/17/95	Kunitake et al.	348	418	
AR		5,404,174	04/04/95	Sugahara	348	700	
AR		5,283,645	02/01/94	Alattar	348	384	
AR		5,259,040	11/02/93	Hanna	382	41	
AR		5,245,438	09/14/93	Alattar	358	182	
AR		5,099,322	03/24/92	Gove	358	105	
AR		4,390,904	06/28/83	Johnston et al.	358	335	

FOREIGN PATENT DOCUMENTS

EXAMINER INITIAL		DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUBCLASS	TRANSLATION YES	NO
AR	A	JP 08 079 695 A	22.03.98	Japan (Abstract in English attached)	H04N	005/262		X
AR	B	WO 98 05696	22.02.98	PCT with Abstract in English	H04N	5/781		X
AR	C	EP 0 690 413 A2	22.06.95	European Patent Office	G06T	7/20		
AR	D	EP 0 675 496 A2	23.03.95	European Patent Office	G11B	27/028		
AR	E	EP 0 660 327 A2	01.12.94	European Patent Office	G11B	27/28		
AR	F	EP 0 660 249 A1	07.12.94	European Patent Office	G06F	17/30		

EXAMINER INITIAL		OTHER DOCUMENTS (INCLUDING AUTHOR, TITLE, DATE, PERTINENT PAGES, ETC.)
AR	1	Hampapur, Arun, dissertation, University of Michigan, 185 pages, 1995, "Designing Video Data Management Systems."
AR	2	Jain, Ramesh, et al., Machine Vision, McGraw-Hill Series in Computer Science, Chapter 4, pp. 112-127, "Image Filtering."
AR	3	Jain, Ramesh, et al., Machine Vision, McGraw-Hill Series in Computer Science, Chapter 5, pp. 140-149, "Edge Detection."

EXAMINER *S. Rao*	DATE CONSIDERED 4/22/99

*EXAMINER: INITIAL IF CITATION CONSIDERED, WHETHER OR NOT CITATION IS IN CONFORMANCE WITH MPEP 609; DRAW LINE THROUGH CITATION IF NOT IN CONFORMANCE AND NOT CONSIDERED. INCLUDE COPY OF THIS FORM WITH NEXT COMMUNICATION TO APPLICANT.

DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE	ATTY. DOCKET NO. VIRAGE.007A	APPLICATION NO. 08/870,836
~~N DISCLOSURE STATEMENT BY APPLICANT~~ (USE SEVERAL SHEETS IF NECESSARY)	APPLICANT Hampapur, et al.	
	FILING DATE June 6, 1997	GROUP ~~2315~~ 2713

U.S. PATENT DOCUMENTS

EXAMINER INITIAL	DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	FILING DATE (IF APPROPRIATE)

FOREIGN PATENT DOCUMENTS

EXAMINER INITIAL		DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUBCLASS	TRANSLATION	
							YES	NO
Al	G	JP 07 079 431 A	20.03.95	Japan (Abstract in English attached)	H04N	7/24		X
Al	H	EP 0 636 994 A1	01.02.95	European Patent Office	G06F	17/30		
Al	I	JP 3 085 076 A	10.04.91	Japan (Title and Synopsis in English, no Abstract Available)	H04N	5/91		X

EXAMINER INITIAL		OTHER DOCUMENTS (INCLUDING AUTHOR, TITLE, DATE, PERTINENT PAGES, ETC.)
Al	4	Nagasaka, Akio and Yuzura Tanaka, Visual Database Systems, II, pp. 113 - 127, Copyright 1992, "Automatic Video Indexing and Full-Video Search for Object Apperances."

EXAMINER A. Cao	DATE CONSIDERED 4/22/11

*EXAMINER: INITIAL IF CITATION CONSIDERED, WHETHER OR NOT CITATION IS IN CONFORMANCE WITH MPEP 609; DRAW LINE THROUGH CITATION IF NOT IN CONFORMANCE AND NOT CONSIDERED, INCLUDE COPY OF THIS FORM WITH NEXT COMMUNICATION TO APPLICANT.

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Notice of References Cited

	Application No.	Applicant(s)	
	08/870,386	Hamapapur et al.	
	Examiner	Group Art Unit	Page 1 of 1
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U.S. PATENT DOCUMENTS

	DOCUMENT NO.	DATE	NAME	CLASS	SUBCLASS
A	5,664,227	9/2/97	Maudlin et al.	395	778
B	5,745,126	4/28/98	Jain et al.	345	952
C	5,767,922	6/16/98	Zabih et al.	348	700
D	5,606,359	2/25/97	Youden et al.	348	7
E	5,635,982	6/3/97	Zhang et al.	348	231
F					
G					
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FOREIGN PATENT DOCUMENTS

	DOCUMENT NO.	DATE	COUNTRY	NAME	CLASS	SUBCLASS
N						
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P						
Q						
R						
S						
T						

NON-PATENT DOCUMENTS

	DOCUMENT (Including Author, Title, Source, and Pertinent Pages)	DATE
U		
V		
W		
X		